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NEW BOOKS

Mathematical Philosophy. A Study of Fate and Freedom. By Cassius J. Keyser. E. P. Dutton and Company, New York, 1922. Pp. 466.

No one who has read Professor Keyser's address on *The Human Worth of Rigorous Thinking* which appeared in the January number of the Mathematics Teacher, and which is a part of the opening chapter of his *Mathematical Philosophy,* can fail to anticipate that this volume will be keen and stimulating. And he will not be disappointed.

But one must not be misled by the description "Lectures for Educated Laymen" which follows the title. This implies a popular character that the book emphatically lacks, if by popular we mean a denatured, sugar-coated work so constructed that a person of normal intelligence can assimilate it with little sensible effort. On the other hand, Professor Keyser has been so careful to define the technical terms which he uses that it would be possible to read the work with appreciation even though, at the start, one had no acquaintance with such topics as inversion, invariants, and non-Euclidean geometry. In this respect, the author has written a book for laymen, but the layman is flattered by the knowledge that it is for scholars as well. One bit of caution must be inserted here. Unlike a series of lectures of the popular variety, these are not units in themselves but are so interdependent that it is difficult if not impossible to read single chapters without reading the preceding ones. It is a course which admits no "cutting."

In the preface, the author states that although the book is primarily addressed to students in philosophy, he hopes these lectures "may not be ungrateful to a much wider circle of readers and scholars" among whom he cites "the growing class of such teachers of mathematics as endeavor to make the spirit of their subject dominate its technique." Many of us are members of this group by self-election. To us therefore, in our conscious or unconscious search for a better understanding of the spirit of mathematics, this work makes an especial appeal. We learn that the Fate and Freedom of the subtitle mean logical fate embodied in the laws of thought, and intellectual freedom whose liberty lies in the keeping of these laws. The connection with our subject comes in this quotation:* "Now it so happens that the term mathematics is the name of that discipline which, because it attains more nearly than any other to the level of logical rigor, is better qualified than any other to reveal the prototype of what is best in the quality of thinking as thinking."

It would be sheer presumption for a person who is an amateur in mathematics and not even that in philosophy, to criticise or comment upon the treatment of the subject matter of this volume, and yet I think it may be permissible to say that Professor Keyser gives one a deeper conception of the meaning of terms we use glibly as postulate, function, limit, infinity, and he gives us a glimpse of the soul of mathematics as he himself sees it. To paraphrase the last sentence of his introductory chapter, he discloses the relation of mathematics to other great forms of intellectual activity especially in its bearings upon the universal interests of humanity.

VERA SANDFORD.

The Lincoln School.

Fundamentals of Practical Mathematics. By GEORGE WENTWORTH, DAVID EUGENE SMITH, and HERBERT DRUERY HARPER. Ginn and Co. Pp. 202.

In reading this book, the reviewer is impressed with (1) the fact that the book teaches. It is more than a collection of practical problems, for it develops those basic principles which the student must know, whatever vocation he is to follow; (2) the thirty-six full page blue prints, which give a sense of reality to the exercise; and (3) its mechanical and literary excellence. The chapter headings—"Fundamental Operations," "Ratio and Proportion," "Mensuration," "Trigonometry," "The Slide Rule," and "General Applications"—warrant the authors in calling their material the *fundamentals* of practical mathematics, for they have not been bound to academic distinctions between the different divisions or subjects of mathematics.

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*Mathematical Philosophy p. 18.